

Marietta City Schools
District Unit Planner

Third Grade

Unit Name	<i>Unit 2: Exploring Multiplication</i>	Unit duration (Days)	5-6 weeks
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[GA K-12 Standards](#)

In this unit, students will explore multiplication through hands-on investigations and authentic problems. Students will explore patterns and properties and discover relationships between multiplication facts. Students will also represent and solve multiplication problems through the context of picture and bar graphs. Students will create statistical investigative questions, collect, analyze, and interpret numerical and categorical data as an entry point for learning about equal-size groups and multiplication.

3.PAR.3 Use part-whole strategies to solve real-life, mathematical problems involving multiplication and division with whole numbers within 100 *Only multiplication in Unit 2

- **3.PAR.3.1** Describe, extend, and create numeric patterns related to multiplication. Make predictions related to the patterns
- **3.PAR.3.2** Represent single digit multiplication and division facts using a variety of strategies. ~~Explain the relationship between multiplication and division~~
- **3.PAR.3.3** Apply properties of operations (i.e., commutative property, associative property, distributive property) to multiply and divide within 100.
- **3.PAR.3.4** Use the meaning of the equal sign to determine whether expressions involving addition, subtraction, and multiplication are equivalent
- **3.PAR.3.6** Solve practical, relevant problems involving multiplication and division within 100 using part-whole strategies, visual representations, and/or concrete models.

3.MDR.5 Solve real-life, mathematical problems involving length, liquid volume, mass, and time and analyze graphical displays of data to answer relevant questions

- **3.MDR.5.1** Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life.
- ~~**3.MDR.5.5** Estimate and measure liquid volumes, lengths and masses of objects using customary units. Solve problems involving mass, length, and volume given in the same unit, and reason about the relative sizes of measurement units within the customary system.~~

3.GSR.7 Identify area as a measurable attribute of rectangles and determine the area of a rectangle presented in real-life, mathematical problems.

- **3.GSR.7.1** Investigate area by covering the space of rectangles presented in realistic situations using multiple copies of the same unit, with no gaps or overlaps, and determine the total area (total number of units that covered the space).
- **3.GSR.7.2** Determine the area of rectangles (or shapes composed of rectangles) presented in relevant problems by tiling and counting

3.MP.1-8 Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals. (It is important to note that MPs 1, 3 and 6 should support the learning in every lesson.)

- **MP.1** Make sense of problems and persevere in solving them.

- **MP.2** Reason abstractly and quantitatively.
- **MP.3** Construct viable arguments and critique the reasoning of others.
- **MP.4** Model with mathematics.
- **MP.5** Use appropriate tools strategically.
- **MP.6** Attend to precision.
- **MP.7** Look for and make use of structure.
- **MP.8** Look for and express regularity in repeated reasoning.

The [Framework for Statistical Reasoning](#) and the [Mathematical Modeling Framework](#) should be taught throughout the units. The [K-12 Mathematical Practices](#) should be evidenced at some point throughout each unit depending on the tasks that are explored. It is important to note that MPs 1, 3 and 6 should support the learning in every lesson 5.

Essential Questions

- (3.PAR.3) How can the properties of multiplication help with multiplication?
- (3.PAR.3) What strategies can be used to solve real-world problems involving multiplication?
- (3.PAR.3) How does understanding the properties of operations help us multiply large numbers?
- (3.MDR.5) How are tables, bar graphs, and line plot graphs useful ways to display data?
- (3.MDR.5) How can tools and models be used to solve problems involving mass, length, and volume?
- (3.MDR.5) How do you solve real world problems involving mass using estimation and customary units?
- (3.MDR.5) How do you measure liquid, length, volume, and mass?
- (3.GSR.7) What strategies can be used to determine the area of a given figure?
- (3.GSR.7) How can we solve real world problems using the knowledge of area
- (3.GSR.7) How can the same area measure produce rectangles with different dimensions? (Ex. 24 square units can produce a rectangle that is a 3 x 8, 4 x 6, 1 x 24, 2 x 12)
- (3.GSR.7) How does understanding the distributive property help us with determining the area of large rectangles?

Tier II Vocabulary Words- High Frequency Multiple Meaning

Array, Multiple, Bar Model, Product, Column, Row, Scale, Equal Groups, Equation, Twice Expression, Factor

Tier III Vocabulary Words- Subject/ Content Related Words

Identity Property of Multiplication, Associative Property of Multiplication, Commutative Property of Multiplication, Zero Property of Multiplication, Bar Graph, Pictograph, Repeated Addition, Distributive Property of Multiplication, Double, Skip Count, Diagram
[K-12 Mathematics Glossary](#)

Assessments

<p>Formative Assessment(s):</p> <ul style="list-style-type: none"> ● MCS K-5 Activity & Assessment Collection ● 3.PAR.3 MCS Mini ● 3.PAR.3.2 MCS Mini ● 3.PAR.3 MIP Module 1 Formative Assessment, p. 15 (facts), p. 19 (Arrays and Multiplication), p. 22-23 (Number lines to multiply), ● 3.PAR.3 MIP Module 3 Fact Assessment, p. 113-115 (Fact Checks) ● 3.PAR.3.3 MCS Mini ● 3.PAR.3.3 MIP Module 2 Formative Assessment, p. 51, p. 57 (Properties of Multiplication), p. 105 (X7 Facts with Distributive) ● 3.GSR.7 MCS Mini ● 3.GSR.7 MCS Mini ● 3.GSR.7 MIP Module 1 Formative Assessment, p. 25 (Area) 	<p>Summative Assessment:</p>
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It is the responsibility of each schools' grade level PLC to identify appropriate instructional lessons and resources, based on data and student needs, using the suggested pacing duration. The following learning tasks have been vetted to align to the standards included in this unit. The GA Dept. of Education strongly recommends that any additional tasks, resources, and/or assessments used for instruction should be vetted using the [Quality Assurance Rubric](#), to ensure alignment to the state standards.

Objective or Content	Learning Experiences Menu		Differentiation Considerations
<p>3.PAR.3 Use part-whole strategies to solve real-life, mathematical problems involving multiplication and division with whole numbers within 100 *Only multiplication in Unit 2</p>	<p style="text-align: center;"><u>GA DOE Learning Plan</u></p> <p><u>Box of Chocolates</u> <i>In this learning plan, students will use arrays and repeated addition to design rectangular boxes.</i> <i>(Suggested Timeframe, 2-3 days)</i></p> <ul style="list-style-type: none"> ● Teacher Guidance ● Student Reproducibles <p><u>Two of Everything</u> <i>In this learning plan, students will build fluency and multiplicative thinking when multiplying by 2.</i> <i>(Suggested Timeframe, 1-2 days)</i></p> <ul style="list-style-type: none"> ● Teacher Guidance ● Student Reproducibles 	<p style="text-align: center;"><u>MCS Curriculum Resources</u></p> <p><u>SAVVAS enVision Topic 1: Understand Multiplication and Division of Whole Numbers</u> <i>Students are introduced to multiplication and division. They use patterns to solve multiplication facts.</i></p> <ul style="list-style-type: none"> ● Lesson 1-1: Relate Multiplication and Addition ● Lesson 1-2: Multiplication on a Number Line ● Lesson 1-3: Arrays and Properties ● Lesson 1-6: Problem Solving: Using Appropriate Tools ● 3-ACT Task: What's the Point? <p><u>SAVVAS enVision Topic 2: Multiplication Facts: Use Patterns</u> <i>Students are introduced to multiplication and division. They use patterns to solve multiplication facts.</i></p> <ul style="list-style-type: none"> ● Lesson 2-1: 2 and 5 as Factors ● Lesson 2-2: 9 as a Factor 	<p>Twos, Fives, and Tens: Solve multiplication problems by using repeated addition</p> <p>Animal Arrays: Solve multiplication problems by using repeated addition</p> <p>A Little Bit More/A Little Bit Less: Derive multiplication facts from 2, 5, and 10 times tables</p> <p>Hit the Spot: Solving multiplication problems using skip counting by twos, fives, and tens</p>

	<p><u>Multiples of 10</u> <i>In this learning plan, students will recognize patterns when multiplying by 10. (Suggested Timeframe 1-2 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles <p><u>Market Day</u> <i>In this learning plan, students will build fluency and multiplicative thinking when multiplying by 5. (Suggested Timeframe 1-2 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles <p><u>Multiple Ways</u> <i>In this learning plan, students will represent multiplication expressions in a variety of ways. (Suggested Timeframe 2-3 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles <p><u>One Hundred Hungry Ants</u> <i>In this learning plan, students will build equal groups. (Suggested Timeframe 1-2 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles <p><u>Skip Counting Patterns</u> <i>In this learning plan, students will explore skip-counting and number patterns. (Suggested Timeframe 2-3 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles <p><u>Wheel Shop</u> <i>In this learning plan, students will work with equal groups to develop multiplicative thinking. (Suggested Timeframe 2-3 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles 	<ul style="list-style-type: none"> • Lesson 2-3: Apply Properties: Multiply by Zero & One • Lesson 2-4: Multiply by 10 • Lesson 2-5: Multiplication Facts: 0, 1, 2, 5, 9, and 10 <p><u>SAVVAS enVision Topic 3: Apply Properties: Multiplication Facts for 3, 4, 6, 7, 8</u> <i>Students apply properties of multiplication and use the relationship between multiplication and division to solve problems.</i></p> <ul style="list-style-type: none"> • Lesson 3-1: The Distributive Property • Lesson 3-2: Apply Properties: 3 and 4 as Factors • Lesson 3-3: Apply Properties: 6 and 7 as Factors • Lesson 3-4: Apply Properties: 8 as a Factor • Lesson 3-5: Practice Multiplication Facts • Lesson 3-6: The Associative Property: Multiply with 3 Factors • Lesson 3-7: Repeated Reasoning • 3 ACT Task: Thirsty Students <p><u>SAVVAS enVision Topic 5: Fluently Multiply and Divide within 100</u> <i>Students explore strategies for solving multiplication and division facts within 100.</i></p> <ul style="list-style-type: none"> • Lesson 5-1: Patterns for Multiplication Facts • Lesson 5-3: Use Strategies to Multiply <p><u>MIP Module 1: Understanding Multiplication and Division</u> <i>The key ideas focused on in this module include understanding the concepts of multiplication and division, using concrete objects and drawings to represent multiplication and division problem situations, creating and interpreting equations to represent multiplication and division problems, and understanding that division is the inverse of multiplication.</i></p> <ul style="list-style-type: none"> • A Set Model for Multiplication, p. 13-17 • An Array Model for Multiplication, p. 18-21 • Introducing a Number Line Model for Multiplication, p. 21-23 • Introducing an Array Model for Multiplication, p. 18-20 	<p>Multiplication In and Out Game: Solving multiplication problems using skip counting by twos, fives, and tens</p> <p>Bug Flip Multiplication: Derive multiplication facts from 2, 5, and 10 times tables</p>
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Double Trouble

In this learning plan, students will multiply by 4 and 8 by using the 2's facts as a foundation. (Suggested Timeframe 2-3 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

Deriving the 3's and 6's Facts

In this learning plan, students will derive multiplication facts from known facts. (3's and 6's) (Suggested Timeframe 2-3 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

Deriving the 9's Facts

In this learning plan, students will use the foundational 10's facts to derive the 9's facts. (Suggested Timeframe 1-2 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

Building Arrays on a Multiplication Chart

In this learning plan, students will build a scaled multiplication chart. (Suggested Timeframe 2-3 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

School Picnic

***Also includes 3.MDR.5**

In this learning plan, students will explore the associative property of multiplication. (Suggested Timeframe 2-3 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

Count Me In

In this learning plan, students will explore area by tiling and relate area measurement to multiplication. (Suggested Timeframe 2-3 days)

- [Teacher Guidance](#)
- [Student Reproducibles](#)

MIP Module 2: Understanding Properties of Multiplication

The key ideas focused on in this module include building an understanding of the commutative, associative, and distributive properties of multiplication, and investigating these properties through concrete models and drawings.

- Exploring the Commutative Property with a Set, number line, and Area Model, p. 46-49
- Exploring the associative property of Multiplication, p. 50-51
- Investigating the Distributive Property with Square Tiles, p. 52-55
- Modeling the Distributive Property on Grid Paper, p. 56
- Three Corners, p. 59
- Agree/Disagree, p. 50-60
- Properties Flap Book, p. 60

MIP Module 3: Fluently Multiply and Divide

The key ideas focused on in this module include developing an understanding of multiplication and division math facts and gaining fluency with multiplication and division math facts.

- Understanding X2 Facts, p. 68-72
- Understanding X10 Facts, p. 75-76
- Understanding X5 Facts, p. 79-81
- Understanding X1 Facts, p. 82-83
- Understanding X0 Facts, p. 85-86
- Understanding X3 Facts, p. 87-89
- Understanding X4 Facts, p. 91-92
- Understanding X6 Facts, p. 94-95
- Understanding X9 Facts, p. 97-98
- Understanding X8 Facts, p. 100-101
- Understanding X7 Facts, p. 103-104
- Games and Activities for Multiplication, p. 106-110

MIP Module 4: Solving One- and Two Step Problems with All Four Operations (*Multiplication only)

		<p>The key ideas focused on in this module include recognizing problem situations that indicate when to add, subtract, multiply, or divide to solve math word problems and building appropriate equations to solve the problems. It also includes understanding problems through retelling, discussing, and constructing models to represent the problem and exploring strategies for solving two-step problems</p> <ul style="list-style-type: none"> ● Introducing Bar Diagrams to Visualize Multiplication and Division Problems, p. 123-126 *Multiplication only 	
<p>3.MDR.5 Solve real-life, mathematical problems involving length, liquid volume, mass, and time and analyze graphical displays of data to answer relevant questions</p>	<p><u>Collecting Data – How Many?</u> <i>In this learning plan, students will analyze data as well as generate their own data based on questions that they have. Students will represent multiplication problems through the context of scaled pictographs and scaled bar graphs. (Suggested Timeframe 3-4 days).</i></p> <ul style="list-style-type: none"> ● Teacher Guidance ● Student Reproducibles <p><u>Pattern Block Graphing</u> *Also includes 3.PAR.3 <i>In this learning plan, students will represent and analyze data using scaled bar graphs (Suggested Timeframe 1-2 days).</i></p> <ul style="list-style-type: none"> ● Teacher Guidance ● Student Reproducibles 	<p><u>SAVVAS enVision Topic 7: Represent and Interpret Data</u> <i>Students represent data on picture graphs and bar graphs. They analyze and interpret data on graphs to solve problems.</i></p> <ul style="list-style-type: none"> ● Lesson 7-4: Solve Word problems using info in graphs ● Lesson 7-5: Problem Solving Precision <p><u>MIP Module 12: Exploring Mass and Volume</u> <i>The key ideas focused on in this module include: understanding units of measure for mass and volume, estimating and measuring mass and volume, and solving one-step problems involving mass or volume using any operation.</i></p> <ul style="list-style-type: none"> ● How Much Does A Container Hold? p. 259 ● Measuring Milliliters, p. 260 ● Problem-Solving With Mass and Volume, p.267 ● Vocabulary Sort, p. 271 <p><u>MIP Module 13: Representing and Interpreting Data and Exploring Linear Measurement</u> <i>The key ideas focused on in this module include drawing a scaled picture graph, drawing a scaled bar graph, solving one and two step problems using data from graphs, measuring to the nearest half and fourth of an inch, and creating line plots with the horizontal scale marked in wholes, halves and fourths.</i></p> <ul style="list-style-type: none"> ● Grab Two Handfuls, p. 285 (scaled bar graph) ● Snow Bar Graph, p. 285 (scaled bar graph) ● Grocery Circular Graphing, p. 285 (scaled bar or 	

		<p>picture graph)</p> <ul style="list-style-type: none"> • 	
<p>3.GSR.7 Identify area as a measurable attribute of rectangles and determine the area of a rectangle presented in real-life, mathematical problems.</p>	<p><u>Making the “Hard” Facts Easier</u> <i>*Also includes 3.PAR.3</i> <i>In this learning plan, students will use the distributive property to decompose area models/arrays into smaller known facts.</i> <i>(Suggested Timeframe 2-3 days)</i></p> <ul style="list-style-type: none"> • Teacher Guidance • Student Reproducibles 	<p><u>SAVVAS enVision Topic 6: Connect Area to Multiplication and Addition</u> <i>Students develop an understanding of the concepts of area and a unit square. They learn different ways to measure the area of a rectangle. They relate area to multiplication and addition</i></p> <ul style="list-style-type: none"> • Lesson 6-1: Cover Regions • Lesson 6-3: Area: Standard Units • Lesson 6-4: Area of Squares and Rectangles • Lesson 6-5: Apply Properties: Area and the Distributive Property • Lesson 6-6: Apply Properties: Area of Irregular Shapes • Lesson 6-7: Problem Solving: Look for and Use Structure <p><u>MIP Module 1: Understanding Multiplication and Division</u> <i>The key ideas focused on in this module include understanding the concepts of multiplication and division, using concrete objects and drawings to represent multiplication and division problem situations, creating and interpreting equations to represent multiplication and division problems, and understanding that division is the inverse of multiplication.</i></p> <ul style="list-style-type: none"> • Introducing an Area Model for Multiplication, p. 24-26 <p><u>MIP Module 14: Understanding the Concept of Area</u> <i>The key ideas focused on in this module include determining area by counting square units, using multiplication to determine area, and decomposing complex figures to determine area.</i></p> <ul style="list-style-type: none"> • Exploring the Area of Rectangles with Square Tiles, p. 293-294 • Exploring the Area of Rectangles with Square Tiles, p. 294-296 	

		<ul style="list-style-type: none"> ● Expressing Square Units p. 297-298 ● Connecting Area to Multiplication, p. 298-299 ● Splitting Rectangles, p. 299-300 ● Additional Ideas and Supports, p. 302-305 	
Content Resources			
<p>MCS Links:</p> <ul style="list-style-type: none"> ● MCS Math Curriculum Map ● MCS Math Instructional Framework <p>GA DOE Links: <i>Access all GADOE Curriculum Resources at the following site: GaDOE Inspire.</i></p>		<p>Additional Resources:</p> <ul style="list-style-type: none"> ● Toy theater (Virtual manipulatives) ● Unit 2 Think and Share ● Greg Tang Math ● Geogebra: Seeing Multiplication Applet <p>Possible Number Sense and Strategy-Development Routine</p> <ul style="list-style-type: none"> ● Estimation180 ● Which one Doesn't belong ● Splat (Instant multiple splats) ● Same or Different (multiplication & division) ● Same or Different (area) ● ESOL Math Talk Starters ● Sentence Stems 	